





## **Overview**

### Introduction

This chapter provides basic first aid and transporting information for injuries encountered in the marine environment. First aid is doing what must be done before expert help is available. It may include:

- Being immediate, and temporary
- Saving life
- Preventing further injury or unfavorable progression
- Preserving vitality and resistance to infection
- Delivering victim if necessary

### In this chapter

These items are discussed in this chapter:

Section	Title	See Page
A	Crew Members' Roles	5-3
В	Treatment for Shock	5-7
С	Resuscitation Methods and Emergencies	5-15
D	Treatment for Wounds, Fractures, and Burns	5-23
Е	Environmental Injuries	5-47
F	Miscellaneous Emergencies	5-61

## Coast Guard Boat Crew Seamanship Manual





## Section A. Crew Members' Roles

## **Overview**

### Introduction

Proper knowledge and skill in first aid are essential for boat crew members. A well trained crew that responds effectively and professionally to an emergency situation may be the difference between life and death or temporary injury and disability of the victim.

### In this section

These items are discussed in this section:

Topic	See Page
Crew Responsibilities	5-4
Handling and Transporting of Injured	5-6



# **Crew Responsibilities**

#### A.1. General

The Coast Guard authorizes crew members to render first aid, consistent with their training, in their role as emergency assistants regardless of their first aid qualifications. A unit commander should always be advised of emergency medical situations. In addition, crew members must contact the Station or Group watchstander and request immediate medical assistance for serious injury cases so that appropriate medical resources can be contacted. The Station or Group will activate an established Emergency Medical Services (EMS) system such as 911, or local fire/rescue squad. Crew members providing first aid must do the following:

- Evaluate the scene.
- Consider are rescuers trained and equipped to safely render assistance.
- Protect themselves from injury or infection.
- Keep calm.
- Act quickly.
- Call station or group as appropriate to activate EMS if necessary.

# A.2. Scene assessment

When responding, make a quick survey of the scene. Do not enter an unsafe scene until fully prepared and protected against hazards such as exposed electrical wires, toxic vapors, fire, blood, or body fluids. As rescuers, injured crew members unable to help anyone else will complicate an already difficult scene.

# A.2.a. Initial patient assessment

Stop and assess the overall condition of the victim. Determine whether or not assisting the patient with the resources at hand is possible or if it requires further help. When more definitive care is required for more serious injury cases, seek assistance immediately. Call for help and



activate the local EMS system. The following information is important to notice during an initial assessment:

- Number of patients
- General condition of patient(s)
- Mechanism [type] of injury
- Patient(s) level of consciousness
- Monitoring for causes or symptoms of shock:
  - Mechanisms consistent with a serious injury such as a gun shot wound, fall from a great height, major burn, crushing accident, etc.
  - If the patient's state-of-health has been compromised, for example, prolonged exposure to the elements, dehydration, malnourishment, etc.

### NOTE &

In this section, serious injury cases are considered those that need attention from a medical professional. A serious case also may be one that a crew decides the injury is beyond its medical capabilities.

# A.3. Protective devices

Human blood may contain blood borne pathogens such as Hepatitis B virus and HIV which causes Hepatitis B and AIDS (respectively). Crew members should take all reasonable precautions to prevent direct contact with human blood by wearing personal protective equipment (PPE) such as clean disposable gloves or more complete equipment depending on the degree of contamination before making contact with the patient. If available, wear masks and eye protection in any instance of known or suspected respiratory infection (i.e., TB). Dispose of blood-soaked gloves and other material with great care. Contact a medical clinic or emergency room for disposal advice. Coast Guard units should maintain information on medical waste disposal.

## WARNING 💖

Unprotected crew members, who come in direct contact with human blood, should immediately report each incident to their operational commander servicing medical facility and follow professional medical advice. Refer to *COMDTINST M6220.8*, *Prevention of Blood Borne Pathogen Transmission*, for more information.



# Handling and Transporting of Injured

#### A.4. General

Transporting injured persons aboard boats to medical treatment facilities is a serious problem regularly encountered by boat crew members. In many situations, it is difficult, if not impossible, for medical help to reach victims. Therefore, the boat crew must possess a basic knowledge of how to transport injured persons safely and quickly to a location where appropriate medical treatment is available.

# A.5. Coxswain duty

The sooner a victim arrives at a place where medical attention is available, the better. It is the responsibility of the coxswain and crew to safely transport the victim as rapidly as possible, while preventing further injury, shock, or unnecessary pain.

# A.6. Moving a patient

Moving a patient is precise work and any carelessness is unacceptable. It requires close teamwork and great care. Even procedures that may seem simple and obvious, such as placing a patient on a stretcher, demand training, coordination, and skill.

These are important rules to remember when transporting an injured person:

- Notify station so that appropriate medical resources can be activated.
- If possible, avoid moving the patient until that person is examined and all injuries are protected by properly applied splints, dressing, etc.
- If head or neck injury is suspected, immobilize prior to movement.
- Seek assistance before moving a patient.
- For conscious patients, always explain the move procedure in advance.
- Patient movements should be careful, deliberate, and the minimum required.
- Almost all patients are transported laying down.



## Section B. Treatment for Shock

## **Overview**

#### Introduction

Shock can be effectively reduced or eliminated if proper steps are taken. It is important that crew members understand how to identify and treat shock. It may accompany injury and can reduce a victim's ability to deal with and survive serious injuries. Shock by itself, even when no injuries are involved, can be very serious and life threatening. **Crew members must be aware of the events and symptoms that cause shock.** 

#### In this section

These items are discussed in this section:

Topic	See Page
Shock Syndromes	5-8
Anaphylactic Shock	5-12



## **Shock**

#### **B.1.** General

### NOTE &

Shock can occur at anytime during first aid and should be assessed first and monitored throughout treatment. Shock is a depressed physiological or mental state. Shock Syndrome, a set of symptoms which occur together, can change throughout treating an injury and are unique for every casualty. Signs and symptoms may develop rapidly or be delayed for up to several hours after the apparent cause. The symptoms usually precede the signs. Several types of shock exist, therefore, recognizing and treating shock immediately is important. Some syndromes do not appear in every casualty nor are they equally noticeable.

#### **B.2.** Causes

Some events that typically cause shock are:

- Trauma (bleeding, blunt (e.g. a fall, being struck by a blunt object, etc.), fractures, and burns)
- Allergic reactions
- Hypothermia
- Drugs
- Toxins
- Heart attack
- Illnesses such as diabetes
- Emotional



# **B.3. Symptoms** and signs

### Symptoms include:

- Restlessness
- Faint
- Thirst
- Nausea
- Weakness
- Anxiousness
- Fright
- Dizziness

### Signs include:

- Pulse weak and rapid
- Breathing shallow, rapid, and irregular
- Skin cold, clammy (sweating)
- Pupils dilated
- State of consciousness alert (may be deceiving) to unconscious

### **B.4.** Assessment

Strong signs and symptoms of shock can be identified by skin color, pulse rate, monitoring respiration, and a victim's level of consciousness. The following table describes the strong signs of shock.



Area	Normal	Signs
Skin Color	Adult skin is normally dry, not excessively pale or wet to the touch, and the observed mental condition is normally calm.	A person in shock may have pale looking skin that is cold and clammy to the touch.
Eyes		Pupils appear to be dilated.
Pulse	Normal pulse for an adult is regular, strong, and between 60-100 beats per minute.	A shock patient will appear restless, and has a pulse that feels weak and is more rapid than normal, usually greater than 100 beats per minute.
Respiration	Normal adult respiration is between 16-24 breaths per minute.	A strong indicator of respiratory distress would be less than 16 breaths per minute, rapid and irregular, or greater than 24 breaths per minute. Immediate assistance is required in these instances to avoid respiratory arrest.
Consciousness	Any time a patient's level of consciousness is other than fully alert, it is a serious indication to seek medical assistance immediately.	Person can appear any where from alert (may be deceiving) to unconscious.

### **B.5.** Treatment

To properly treat shock once it has been identified, boat crew members must administer initial treatment, followed by executing steps to ensure the effects of shock are kept at a minimum.



# B.5.a. Initial treatment

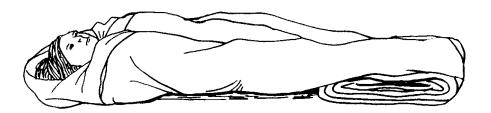
Initial treatment for shock includes limiting a patient's activity, ideally have the person lie down, being alert for the signs and symptoms of shock. If unconscious, appropriate treatment is to activate EMS, and institute resuscitation procedures.

If CPR is not necessary, then identify other injuries, lie the victim down, keep the victim warm if not already overheated.

# B.5.b. Continuing treatment

Additional procedures must be followed and completed in order to control the effects of shock upon the victim:

- Check for "medic alert" or other information tags
- Obtain history for medical problems (heart disease, diabetes, allergies, medications)
- Notify station or group to obtain help and transport as advised
- Provide specific treatment if advised and trained to do so
- Position flat on back, elevate the lower extremities about 8 to 10 inches, if no head injury or trouble breathing and being careful of any other injuries (See Figure 5-1).



# Elevating Lower Extremities Figure 5-1

- Cardiopulmonary resuscitation (CPR) if indicated and trained to provide
- Warm (blankets) (If hot, do not warm.)
- Moisten lips, do not allow patient to eat or drink
- Never give alcohol
- Handle gently



# **Anaphylactic Shock**

### **B.6.** General

Anaphylactic shock is a rapid, extreme allergic reaction. People who are subject to this type of shock should carry medical identification at all times. Sensitivity reactions can occur within seconds of contact and can result in death within minutes of contact. It is imperative to be able to recognize the signs and symptoms of anaphylactic shock in order to relay the gravity of the situation to qualified medical personnel.

#### **B.7.** Causes

Anaphylactic shock can be caused by eating fish or shellfish, ingesting particular types of berries or oral drugs such as penicillin. Insects stings from yellow jackets, hornets, wasps, etc., injected drugs, exercise, cold, and inhaled substances such as pollen or dust may also cause sensitivity reactions.

# **B.8.** Symptoms and signs

Symptoms of anaphylactic shock include:

- Skin: itching; hives (raised rash); flushing (redness)
- Swelling of lips; tongue; feet; throat; hands
- Respiratory tract: wheezing; shortness of breath; coughing
- Gastrointestinal: nausea and vomiting; abdominal cramps; diarrhea
- Headache
- Sense of impending doom
- Loss of consciousness

Onset of symptoms may be rapid, within seconds, or delayed (up to two hours).

The signs for anaphylaxis are the same as those of shock.



### **B.9.** Treatment

Anaphylactic shock requires medication to counteract the allergic reaction to the substance. If the victim carries an epinephrine kit, you may assist them in administration, if trained. Treat the victim for shock and, if necessary, proceed to administer CPR.

- do not minimize an allergic reaction
- death can occur within minutes
- always keep station appraised of the situation so that appropriate medical resources can be activated: medical attention should be obtained regardless of patient's response
- record all that is observe or performed
- reactions with similar symptoms include hyperventilation; alcohol intoxication; hypothermia; low blood sugar; anxiety attack





# Section C. Resuscitation Methods and Emergencies

### Overview

### Introduction

When a person stops breathing, seconds count. Death can occur within four to six minutes after respiratory failure. It is imperative to start resuscitation immediately. Boat crew members are required to attend training every six months to learn and maintain effective resuscitation methods and skills. Auxiliary crew members, although not required, are encouraged to maintain their skills through training by qualified, certified instructors and maintain their record of certification.

Events that may cause people to stop breathing include:

- Near drowning
- Suffocation
- Electrocution
- Poison gas
- Heart attack
- Drug overdose
- Choking

#### In this section

These items are discussed in this section:

Topic	See Page
Resuscitation Procedures	5-16
Heart Attack	5-18
Stroke	5-19
Scuba Incidents	5-20



### **Resuscitation Procedures**

### C.1. General

**Resuscitation** is a general term that covers all measures taken to restore life or consciousness to an individual. Measures taken to restore life include artificial respiration, cardiac compression, and cardiopulmonary resuscitation (CPR).

# C.2. Artificial respiration

Artificial respiration, starting normal respiratory function, includes rescue breathing maneuvers such as mouth-to-mouth, mouth-to-nose, and mouth-to-stoma. A stoma is the opening in the lower neck through which individuals breathe when they have had their voice box removed.

# C.3. Cardiac compression

Cardiac compression is a method used to restore normal blood flow to the brain.

#### C.4. CPR

Cardiopulmonary resuscitation (CPR) uses both artificial respiration and cardiac compression to revive a victim with respiratory failure. Once started, it must be continued until properly relieved. The resuscitation procedures are outlined in the following table.

Step	Procedure		
1	<b>Establish unresponsiveness:</b> attempt to rouse the victim by		
	shaking and shouting (initial evaluation entails determination of		
	patient's responsiveness). Activate EMS prior to starting any		
	further evaluation or treatment.		
	<b>Look:</b> to see if the chest rises and falls		
	Listen: for air exhalation through nose and mouth		
	<ul> <li>Clear the victim's airway if no there are no signs of</li> </ul>		
	exhalation and listen again for air exchange.		
	<b>Feel:</b> for the victim's pulse and air flow from nose or mouth		
	• If there is no pulse or respiration, call for help immediately.		
	Attempt two breaths of CPR, and, if there is no response,		
	perform the 1-man CPR procedure prescribed by the		
	American Heart Association or American Red Cross for		
	Basic Life Support.		
2	Treat for shock.		



Step	Procedure		
3	<b>Perform CPR:</b> if the victim's heart stops or respiratory failure		
	reoccurs after initial resuscitation, reinstitute CPR		
4	Obstructed Airway Procedures: should be performed if the		
	victim begins choking		
	<ul> <li>Attempt to clear the object first by chest thrusts (infants,</li> </ul>		
	obese, or pregnant persons) and back blows (infants) or by		
	abdominal thrusts.		
	<ul> <li>Next, attempt back blows.</li> </ul>		
	<ul> <li>If the object is still not cleared, reposition the patient's</li> </ul>		
	airway and sweep his or her throat. Do Not probe blindly as		
	this may force the object deeper into the throat.		
	<ul> <li>Continue with back blows or abdominal thrusts until the</li> </ul>		
	airway is clear or until medical assistance arrives.		



### **Heart Attack**

#### C.5. General

A **heart attack** is always considered a medical emergency since the victim is in significant danger of going into cardiopulmonary arrest and dying. Contact medical assistance immediately.

### C.6. Symptoms

There are many symptoms of a heart attack, some of which may not be noticed or recognized by a victim. Though heart attacks can occur without displaying all of these symptoms, the following are all symptoms of a heart attack:

- Severe, crushing type of pain under the breastbone, arms, neck, and jaw
- Profuse sweating
- Shortness of breath
- Extreme anxiety
- Nausea and vomiting
- Bluish discoloration of lips, fingernails, and skin

#### C.7. Treatment

The following is the treatment for a heart attack:

- Keep a victim quiet and at rest. Administer oxygen via face mask.
- Place a victim in the position of most comfort. Sometimes the victim may want to sit up, especially if the person is short of breath.
- Seek immediate medical assistance, activate local EMS system.
- Determine if a victim is on any type of medication for a heart condition such as nitroglycerin. If so, determine if the victim has taken the medication as prescribed.
- Reassure the patient that assistance is on the way or that transport to a hospital is imminent.
- Transport as quickly, but as safely, as possible.



### **Stroke**

#### C.8. General

A **stroke** is any bleeding or clotting affecting the blood vessels of the brain. Strokes can be mild or extremely serious and care must be taken to treat and transport stroke victims so that additional injury does not occur. Seek medical attention immediately.

### C.9. Symptoms

The symptoms of a major stroke are unconsciousness and shock, analysis of any part of the body or visual disturbances. However, if brain damage is slight, the only symptoms may be:

- visual disturbances,
- dizziness,
- headache;
- facial droop,
- difficulty in speaking, or
- muscular difficulty involving a body part.

Signs and symptoms may be temporary or come and go.

#### C.10. Treatment

Activate EMS. Obtain medical assistance immediately. Treat as for shock. If the victim has difficulty breathing, help the person maintain an open airway and give mouth to mouth resuscitation, if needed.



### **Scuba Incidents**

### C.11. Coast Guard action

The Coast Guard has no statutory responsibility for providing recompression treatment equipment or for managing decompression sickness cases in SAR cases involving self contained underwater breathing apparatus (SCUBA) diving accidents. However, individuals may request Coast Guard assistance in locating appropriate treatment facilities and for transport to such facilities. The Coast Guard shall limit assistance to arranging or providing transportation for victims and advising interested parties of the location for the nearest recompression facility. The Coast Guard boat crew should treat for shock (do not elevate the legs), while arranging for evacuations.

# C.12. Types of scuba incidents

Scuba diving accidents include all types of body injuries and near drowning. Commonly, a scuba diving accident occurs due to an existing medical problem. There are two special problems usually seen in scuba diving accidents:

- Air emboli
- The "bends"

#### C.12.a. Air emboli

**Air emboli**, or air bubbles in a diver's blood, are most often found in divers who hold their breath during ascent. This typically happens following an equipment failure, or some other underwater emergency. Divers can develop an air embolism in very shallow waters. The onset of symptoms is often rapid and a victim's senses may become distorted. Victims may have convulsions and can quickly lose consciousness.

C.12.b. The "Bends"

### NOTE &

Immediately transport or evacuate all patients with possible air emboli or decompression sickness to the nearest medical facility. "Bends" is decompression sickness, which may occur as the result of coming up too quickly from a deep, prolonged dive. Rapid ascent defeats the body's ability to filter escaping gases through the lungs resulting in nitrogen gas bubbles in the blood stream. The onset of the "bends" is usually slow for scuba divers, taking from one to 48 hours to appear. Divers increase the risk of decompression sickness if they fly within 12 hours after a dive. The symptoms and signs of decompression sickness include deep pain to the muscles and joints, choking, coughing, labored breathing, chest pains, and blotches on the skin (mottling).



# C.12.c. Associated medical problems

Major medical problems associated with the escape of air into the chest cavity or tissues may occur in asthmatics who participate in scuba activities. The symptoms may be acute shortness of breath and the signs may be similar to shock. Immediate advance medical attention is required. Activate EMS and transport as quickly as possible. Treat for shock.

# C.13. Treating scuba incidents

Position a patient for optimum breathing comfort, which for a conscious patient is usually sitting up. DO NOT let a patient lie flat and/or elevate legs:

- Treat for shock
- Do not let a patient lie flat or elevate legs
- Get dive profile

# C.14. Equipment availability

Each District Rescue Coordination Center (RCC) and Group Operations Center (OPCEN) has information on all recompression chambers located within its area of operations. In addition, Diver's Alert Network (DAN) can be contacted by telephone for further assistance at (919) 684-8111. The RCC or OPCEN will need the following medical information to arrange the correct response for a scuba incident:

- Depth of a victim's diving activities
- Number of dives that day
- Victim's overall medical condition including current level of consciousness
- First occurrence of victim's symptoms (i.e., during ascent, immediately after reaching the surface, etc.)
- Problems which may have occurred during the dive, such as a panic ascent, loss of air at depth, or equipment failure





# Section D. Treatment for Wounds, Fractures, and Burns

## **Overview**

### Introduction

In emergency situations, boat crew members must be able to temporarily treat severe hemorrhaging wounds, broken bones, and burn victims. As the first on the scene, boat crew members must try to keep a victim calm, immobile, and alive until professional medical assistance can be provided.

### In this section

These items are discussed in this section:

Topic	See Page
Bandages	5-24
Bleeding	5-26
Fractures (Broken Bones)	5-35
Burns	5-44



# **Bandages**

#### D.1. General

This section provides basic information about first aid bandages and splints. Preferably, use sterile bandage material in standard first aid or EMT kits. Otherwise, any large piece of clean cloth can be used as a bandage, binder, or sling.

# D.2. Types of bandages

A bandage is a strip of woven material that holds a wound, dressing, or splint in place, helping to immobilize, support, and protect an injured part of the body.

Various types of bandages come in first aid kits. They are designed to be adaptable to many different situations. For example, some are for covering large areas but may be used as slings and others are useful as a thick pad for applying pressure over a wound to control hemorrhaging. The following table describes the different types of bandages and their uses.

### NOTE &

If bandages are not available, other emergency bandages can be handkerchiefs, linen, belts, ties, etc.,. Hold a substitute bandage in place with adhesive, plastic, or masking tape, safety pins, etc.

Bandage Type	Use
Binder	A binder of muslin is used for injuries to the chest or
	abdomen. Use a large towel or part of a sheet as a substitute
	for a binder. Hold the binder in place with pins, multiple ties,
	or other bandages e.g., cravat bandages. Do not apply a
	binder so tightly that it interferes with breathing.
Gauze	Gauze is useful as a bandage for almost any part of the body.
Bandages	Most common uses of gauze bandages are as circular
	bandages and spiral bandages.
Band Aids	Band aids or substitutes are useful for small wounds that are
	clean.
Triangular	Triangular bandages are useful as an emergency cover for an
Bandages	entire scalp, hand, foot, or other large area. Also, use these
	bandages as a sling for a fracture or other injury to an arm or
	hand. A triangular bandage can be rolled into a cravat
	bandage (a long, narrow strip). It is also useful as a figure
	eight bandage, tie for a splint, constricting band, or
	tourniquet. A folded cravat bandage can serve as an
	emergency dressing for control of bleeding, or over another
	dressing, to provide protection and pressure.



# **D.3.** Bandage application

There are two general principles for bandage application:

- A bandage should be snug, but not so tight as to interfere with circulation either at the time of application or later if swelling occurs.
- A bandage is useless if tied too loose.

### D.3.a. Circulation

Prevent interfering with circulation by:

- Leaving the person's fingertips or toes exposed when applying a splint or bandage to arms or legs.
- Loosening bandages immediately if a victim complains of numbness or a tingling sensation.
- Watching for swelling, color changes, and cold or cool tips of fingers or toes.



# **Bleeding**

#### D.4. General

Hemorrhage, or bleeding, is the escape of blood from arteries, veins, or even capillaries because of a break in their walls.

# D.5. Types of bleeding

There are several different types of bleeding. Boat crew members must learn to recognize the basic types in order to know how to stop the hemorrhaging as quickly as possible. Types of bleeding include:

- Arterial
- Venous
- Capillary

# D.5.a. Arterial bleeding

Blood that is coming from an artery is bright red and gushes forth in jets or spurts that are synchronized with the victims pulse.

# D.5.b. Venous bleeding

Blood coming from a vein is dark red and comes in a steady flow.

# D.5.c. Capillary bleeding

Blood coming from damaged capillaries (smaller veins) is bright red in color and oozes from the wound.

## D.6. Risk assessment and management for prevention of blood borne pathogens

Evaluate the risk of acquiring a blood borne pathogen such as Hepatitis B or HIV. Risk may be managed by the use of appropriate personal protective equipment. Use at least latex or vinyl gloves. More extensive equipment may be required depending on the situation. If not trained or equipped to handle the situation, notify the group or station so that appropriately trained and equipped personnel can be mobilized. Do not become involved if not adequately protected.

# D.6.a. Universal medical precaution

In those instances where crew members may be exposed to human tissues (e.g., blood, seepage from burns, saliva, urine or feces), members should take appropriate precautions to prevent contamination by using protective gloves and goggles. Additional precautionary measures include the wearing of masks and protective gowns or aprons. Under all circumstances, thorough washing of hands and any contaminated area should be done with soap and water. Thoroughly wash hands with soap and water, even if gloves have been used."



# **D.7.** Control of bleeding

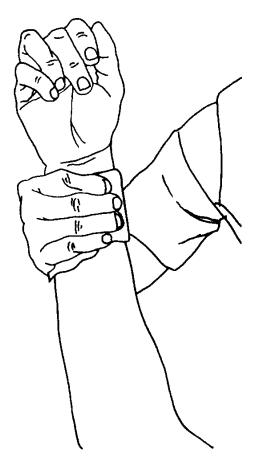
Control of a severe hemorrhage is always urgent. With only 10 pints of blood in the human body, arterial bleeding can cause death in a short time.

D.7.a. Direct pressure

The best method to control hemorrhaging is applying direct pressure to the wound. To apply direct pressure, place the palm of a gloved hand over the wound. Use sterile disposable gloves and never apply an ungloved hand onto an exposed wound. To reduce the flow of bleeding, raise the injury so that it is at a level higher than the heart. Do this only if a change in position will not cause additional harm to a victim (See Figure 5-2). If immediately available, or if direct pressure does not control the bleeding, try using a thick pad of cloth held between the gloved hand and the wound.

### WARNING 💖

To avoid any contact with infectious fluids, including blood, always wear clean disposable gloves when performing first aid.



**Applying Direct Pressure Figure 5-2** 



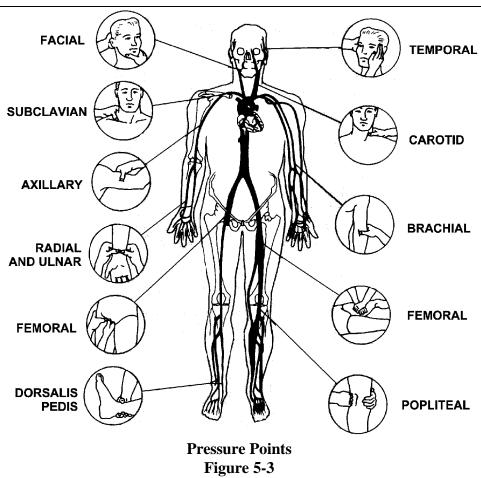
# D.7.b. Pressure points

If bleeding persists after applying direct pressure or if there is severe arterial bleeding, digital pressure can be applied at pressure points. Pressure points are areas in the body where a major artery flows over a bony prominence. There are 26 pressure points in the human body, 13 on each side, situated along the main arteries (refer to Figure 5-3):

- Temporal
- Facial
- Carotid
- Subclavian
- Axillary
- Brachial
- Radial Ulnar
- Femoral
- Popliteal
- Doralis pedis

Always be extremely careful when applying indirect pressure (pressure points) as it may cause damage to the limb due inadequate blood flow. Do not substitute indirect pressure for direct pressure, use both simultaneously. Refer to the following table for location of pressure points and related areas, and the procedure to apply pressure to each area.

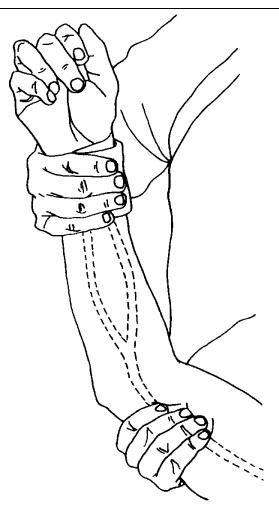






Pressure Point	Location	Procedure
Temporal	Scalp or head	Use this pressure point for no longer than 30 seconds as it may cut off blood to the brain.
Facial	This point is located in the "ridge" along the lower edge of the bony structure of the jaw.	Use only for a minute or two to help slow blood flow from a cut on the face.
Carotid	Begin at the trachea at the midline of the neck	Slide your fingers to the sight of the bleeding and feel for the pulsations of the carotid artery. Place fingers over the artery and thumb behind the neck. Apply pressure by squeezing fingers toward the thumb. Never apply pressure to both sides of the neck at the same time. Apply pressure for only a few seconds as this procedure cuts off blood circulation to the brain.
Subclavian	Deep behind the collar bone in the "sink" of the shoulder	Push thumb through the thick layer of muscle at the top of the shoulder and press the artery against the collarbone.
Axillary	Under the upper arm	Press the artery just under the upper arm against the bone from underneath.
Brachial	Groove on the inside of the arm and elbow; two locations, near the elbow joint.	Apply pressure to the point, grasp the victim's arm with the thumb on the outside of the arm and fingers on the inside. Press fingers towards the thumb. See Figure 5-4.





Brachial Artery Figure 5-4

Pressure	Location	Procedure
Point		
Radial and	Radial point	Apply pressure to both points to control
Ulnar	located on	bleeding of the hand. Use the radial point
	forearm close	to control bleeding of the wrist.
	to the wrist on	
	the thumb side	
	of the hand;	
	ulnar point	
	located on little	
	finger side of	
	the hand	



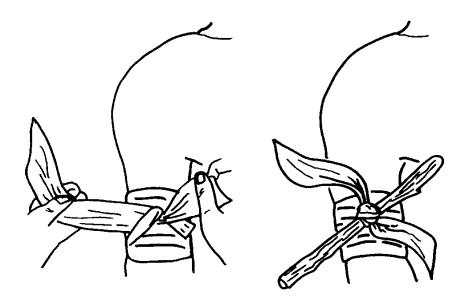
Pressure Point	Location	Procedure
Femoral	Front center part of the crease in the groin area, pelvic basin; two locations	Used to control severe bleeding on the lower extremity and leg amputation. Place heel of the hand directly on the point and apply a small amount of pressure to the artery across the pelvic basin.
Popliteal	Back of the knee	Apply pressure to the point to control bleeding from a leg wound.
Dorsalis Pedis	Top of foot	Apply pressure to control bleeding from the foot and toes.

## D.8. Treatment

Refer to the table below for procedures for treating hemorrhages.

Step	Procedure
Bandage	Apply a sterile, if available, or clean piece of gauze or cloth
Application	to the wound. Do not remove this dressing if it becomes
	blood soaked. Reinforce the dressing with a second or third
	bandage on top of the original one. Elevating the extremity
	after applying direct pressure should control most bleeding.
Pressure	A pressure bandage can replace direct hand pressure on
Bandage	most parts of the body. Apply the pressure bandage by
	placing the center of the bandage or strip of cloth directly
	over the pad. Hold the pad in place by circling the bandage
	ends around the body part and tie it off with a knot directly
	over the pad (See Figure 5-5).





Pressure Bandage Figure 5-5

Step	Procedure
Elevating	If direct pressure does not control the bleeding, then
Injured Area	elevate the injured area, but only if no bone injury is
	involved.
Pressure	Apply pressure by placing the heel of the gloved hand
Points	directly over the spot. Lean forward with the arm straight
	to apply direct and constant pressure.
Tourniquet	If severe bleeding cannot be controlled after trying all
	other means and the victim is in danger of bleeding to
	death, use a tourniquet. Remember that a tourniquet is
	useful only on arms and legs. A tourniquet is a constricting
	band placed around an extremity, then tightened until
	bleeding from an artery has stopped. When a tourniquet is
	required, use the tourniquets available in a standard Coast
	Guard first aid kits. Otherwise, use any wide gauge
	material such as a webbed belt strap with a buckle.
	Apply a tourniquet as outlined in the following steps.



# D.8.a. Applying tourniquets

Refer to the following procedures when applying a tourniquet.

# WARNING 💖

Tourniquets can be	
extremely	
dangerous!	
Tourniquets should	
only be used when a	
victim is in danger	
of bleeding to death!	
A tourniquet should	
only be tight enough	
to stop the bleeding!	
Never hide a	
tourniquet with a	
splint or bandage.	

Step	Procedure
1	Place the tourniquet two to three inches above the wound, but not
ı	touching the wound edges. If the wound is in a joint area or just
	below a joint, place the tourniquet directly above the joint.
2	Wrap the tourniquet band tightly around the limb twice and secure
	it in place.
3	Attach a note to the victim giving the location of the tourniquet
	and the time that it was applied. Always leave the tourniquet
	exposed to view. If it is not possible to attach a note, write the
	letter "T" on the patient's forehead with a grease pen, lipstick, or
	other suitable marker, and show the time it was applied.
4	After making the decision, and applying a tourniquet, DO NOT
	LOOSEN IT. This requirement may be modified, but only under
	the following circumstances. As soon as the tourniquet is applied,
	if the injured person does not otherwise require treatment for
	other life threatening conditions (e.g., shock or hypothermia), the
	wound site should be cleaned to facilitate evaluation of the
	bleeding site. Once the source of the bleeding has been identified,
	the crew man can now initiate primary control of the bleeding by
	direct pressure or packing with pressure, followed by the release
	of the tourniquet. The process of bleeding control (i.e., direct
	pressure, pressure points) can be repeated as necessary.
5	Continue to treat for shock and obtain medical attention
	IMMEDIATELY.



# Fractures (Broken Bones)

#### D.9. General

Broken bones are frequently encountered by boat crews in the course of many rescue situations. It is important to develop the ability to identify fractures immediately and treat them properly. Failure to do so can seriously complicate a fracture as well as cause other injuries.

# **D.10.** Types of fractures

A fracture is a broken or cracked bone. For performing first aid, boat crew members should be aware that there are two types of fractures:

- **Compound (open) Fracture:** The bone has broken and an open wound is present. The bone may protrude from the wound, leaving little doubt that there is a fracture.
- **Simple (closed) Fracture:** No open wound is present, but the bone may be broken or cracked. Take care when handling a closed fracture as careless treatment may cause an open fracture, lacerate a blood vessel, or cause more injury.

### **D.11. Symptoms**

Indications that a fracture has occurred may include:

- Pain, swelling, and discoloration at the injury site
- Misalignment (deformity) and/or disability of the injured part
- Victim's information (may have heard a "crack" or "snap")

# D.12. Handling a fracture

Treat every suspected fracture as if it were a fracture until it is proven otherwise. Handle as follows:

# D.12.a. Limit movement

Do not attempt to straighten broken limbs. Eliminate all unnecessary handling of the injured part. Be gentle and use great care when handling any broken limb.

### D.12.b. Immobilize

Protect and immobilize all injured areas. Check for the possibility of more than one fracture. Do Not be deceived by the absence of deformity and/or disability. (In many fracture cases, the victim may still have some ability to use the limb). Keep the broken bone ends and the joints immobilized above and below the injury.



D.12.c. Check pulse

Check pulse in the area of the fracture before and after splint application.

D.12.d. Splint

### WARNING 💖

Never hide a tourniquet with a splint or bandage.

Use a splint to immobilize the fracture. Selecting exactly the proper splint is less important than achieving immobilization. Whenever possible, splint a fractured arm to the patient's chest and a fractured leg to the other (unbroken) leg. Apply splints before moving the victim, while avoiding manipulating the injured areas. Apply the splint snugly, but do not cut off circulation. Splints should be well padded. Leave tips of fingers and toes exposed and check them often for circulation adequacy.

D.12.e. Shock

Treat the injured person for shock. (Refer to Section B of this chapter.) Be alert for the development of shock during treatment. Shock may develop as a result of the fracture, pain from the treatment or other injuries not evident on initial assessment.

# **D.13.** Treatment of specific bones

In the human body there are 206 bones. Several of these bones, if broken or injured, require very specific treatment based on the sensitive nature of their functions or their proximity to delicate organs or arteries.

D.13.a. Spine

Any actual or suspected damage to the spine requires definitive care and careful management. Permanent disability, paralysis, or death can result from a spine injury.

- Treat all suspected spinal injuries by maintaining alignment and immobilizing the spine as quickly and completely as possible.
- Seek further medical assistance immediately.
- Move a patient only as a last resort.
- Keep a patient flat and do not move the person's head.
- When transporting a patient, immobilize on a rigid stretcher and carry the patient face up.
- Do not splint neck and spine fractures unless properly trained.



#### D.13.b. Skull

The primary aim is to prevent further injury to the head, so do not spend time figuring out whether there is a fracture or penetration to the skull.

- Do not let a patient move or try to move the person any more than absolutely necessary.
- Do not let a patient with a head injury become cold and do not give the person anything to drink or any pain medication.
- Control bleeding by the use of absorbent dressings without applying direct pressure.
- Seek immediate medical assistance.

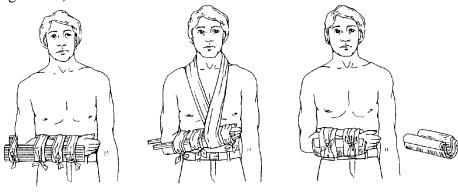
#### D.13.c. Extremities

When encountering actual or suspected fractures to any of a victim's extremities, these are the general steps that must be followed:

Step	Procedure	
1	Check for a pulse and sensation of touch in fingers or toes before	
	and after a splint has been applied. If either of these is absent, it	
	increases the likelihood of permanent damage. Make certain a	
	splint is not applied over a bony prominence or tied too tightly.	
	Loosen if necessary to reestablish feeling and pulse.	
2	If possible, splint the injured part in proper alignment. If this is not	
	possible, splint to immobilize the limb in the position found.	
3	If bone ends protrude from the skin, cover the exposed bone with	
	a sterile dressing and handle with great care when splinting.	

#### D.13.d. Forearm

Place two well padded splints, top and bottom, from elbow to wrist. Bandage in place. Hold the forearm across the chest with a sling (See Figure 5-6).

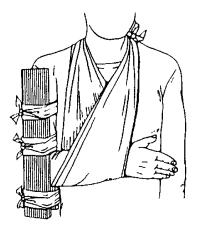


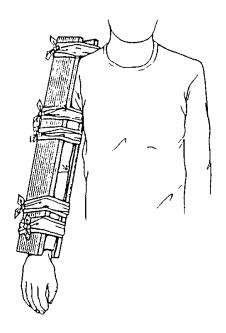
Broken Forearm Figure 5-6



#### D.13.e. Upper arm

For fracture near the shoulder, put a towel or pad in the armpit, bandage the arm to the body, and support the forearm in a sling. For fracture of the middle upper arm, use one splint on the outside of the arm, shoulder to elbow. Fasten the arm to the body and support the forearm in a sling. For a fracture near the elbow, do not move the arm at all. Splint it as it is found (See Figure 5-7).





Broken Upper Arm Figure 5-7



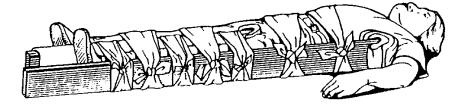
### D.13.f. Thigh

Due to the large artery and muscle mass, this is often a major injury and a traction splint may be required. Seek immediate medical assistance. This treatment management requires an EMT or person with more detailed training.

If an EMT or other qualified person is unavailable:

Step	Procedure	
1	Use two splints, an outside one from armpit to foot and an inside	
	one from crotch to foot.	
2	Fasten the splints around the ankle, over the knee, below the hip,	
	around the pelvis, and below the armpit.	
3	Tie both legs together. Do not move a patient until this has been	
	done (See Figure 5-8).	

This injury is often associated with major trauma and bleeding may occur if the thigh bone severs the adjacent femoral artery. Closely monitor a patient for signs of shock and do not manipulate the leg.

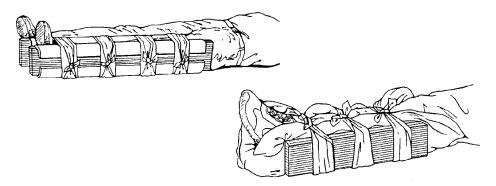


Broken Thigh Figure 5-8



D.13.g. Lower leg

Use three splints, one on each side and one underneath. Always pad these splints well, especially under the knee and at the ankle bones. Also, use a pillow under the leg with the edges brought around in front and pinned; then add two side splints (Figure 5-9).



Broken Lower Leg Figure 5-9



D.13.h. Collarbone Use the following procedures to immobilize the collarbone:

Step	Procedure	
1	On the injured side, place the forearm across the chest, palm	
	turned in, thumb up, with hand four inches above the elbow.	
2	Support the arm in this position with a sling.	
3	Fasten the arm to the body with several turns of bandages around	
	the body and over the hand to keep the arm close against the body	
	(Figure 5-10).	



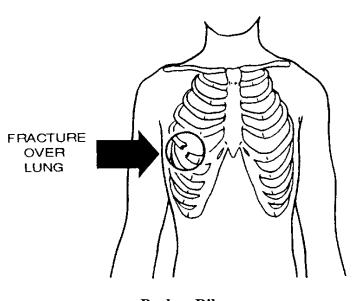
**Broken Collarbone** Figure 5-10



D.13.i. Rib

A broken rib can be very painful and very dangerous because of the opportunity for a broken rib to puncture a lung. A patient coughing up frothy bright red blood may have a punctured lung. Seek assistance immediately and activate EMS.

If the crew member believes that a rib is broken, but the victim indicates that there is no pain, then do not do anything to try to ease pain (See Figure 5-11).



Broken Rib Figure 5-11

Administer oxygen with patient at rest in a sitting position. This eases the effort required to breathe. Patients with known or suspected fractured ribs should be given a high priority for transport to a medical facility.

D.13.j. Nose

Stop the bleeding. If conscious, have the patient sit with his or her head tilted backward. DO NOT tip head back if victim feels nauseated. A patient should breathe through mouth. A cold compress or an ice bag over the nose eases pain, reduces swelling, and usually stops the bleeding. Place unconscious victim on his or her side to keep airway open.



#### D.13.k. Jaw

If an injury to the jaw area interferes with a victim's breathing,

Step	Procedure	
1	Pull the lower jaw and tongue forward and keep them forward.	
2	Apply a four-tailed bandage under the jaw, with two ends tied on	
	top of the front of the head.	
3	Tie the other two tails on top of the head, and at the back, so the	
	bandage pulls the jaw up and to the rear.	

A bandage must support and immobilize the jaw, but not press on the throat. Place an unconscious victim on his or her side. Have a conscious victim sit up.

#### D.13.l. Pelvis

#### WARNING 💖

Never "log-roll" a victim with a pelvic fracture.

Treat a patient with a pelvis injury for shock, but do not move unless absolutely necessary. When moving a patient, handle the person the same as a victim with a fractured spine.

- Bandage the legs together at the ankles and knees and place a pillow at each hip and secure them.
- Fasten the patient securely to the stretcher.

This injury is often associated with major trauma and frequently involves bleeding that is undetectable. Closely monitor a patient with a pelvic fracture for signs of shock which may be caused by heavy internal bleeding.



#### **Burns**

#### D.14. General

Burns are classified by depth or degree of skin damage. The following are the three general classifications of burns:

- First degree
- Second degree
- Third degree

## D.15. Causes of burns

NOTE &

Burns, regardless of the cause, may cause a person to go into shock. Causes of burns include:

- Thermal,
- Chemical,
- Sunburn,
- Electric shock, and
- Radiation.

## D.16. Burn classification

Burns can range from minor irritations to life threatening and disabling. Proper first aid, administered quickly, can minimize damage resulting from burns and can make the difference between life and death in serious situations. For these reasons, it is very important that boat crew members be able to quickly determine the type and seriousness of burns in order to treat them quickly and properly. In general, the size of the burn is more important than the degree of the burn.

D.16.a. First degree

First degree burns are the mildest form of burns. These burns involve only the outer layer of skin and produce redness, increased warmth, tenderness, and mild pain.

D.16.b. Second degree

Second degree burns extend through the outer layers of the skin. These burns involve the inner layers of the skin, but not enough to prevent rapid regeneration. They produce blisters and are characterized by severe pain, redness, and warmth.



D.16.c. Third degree

Third degree burns are those that penetrate the full thickness of the skin, destroying both the outer and inner layers. Severe pain, characteristic of second degree burns, may be absent because nerve endings have been destroyed. Color may range from white and lifeless to black (charred). Healing occurs only after many months, and results in scarring of the skin tissue. Skin grafts are generally required to achieve full healing.

NOTE &

Burns of the respiratory tract are very serious and may be diagnosed by singed eyelashes, hoarseness, sore throat, or coughing of blood.

## D.17. Burn first aid

In order to determine roughly what percentage of a victim's body surface area has suffered some type of damage (burns, etc.), use the following estimates for adult patients:

CHEST	= 18%
BACK	= 18%
EACH ARM	= 9%
EACH LEG	= 18%
HEAD	= 9%
GENITALS	= 1%

General first aid procedures for all burns include the following:

- Eliminate the source of the burn. Extinguish and remove smoldering clothing. Do not remove charred clothing that may be sticking to the burn.
- For burns resulting from electrical shock ensure the patient is no longer receiving electrical shock.
- Treat to prevent or reduce shock
- Try to prevent infection
- Do not apply any type of ointment on burns

In addition to these general steps, the following are first aid procedures for burns that apply specifically to particular classes of burns.



## D.17.a. First degree

Minor burns: immerse in cool water until pain is relieved. Flush chemical burns for a least 20 minutes. Cover with clean or sterile air tight wrap. Plastic food wrap applied over a clean or sterile dressing can be used to reduce air exposure.

## D.17.b. Second degree

Use the same treatment as for first degree burns. Do not break open any blisters. Cover with a dry, sterile, non adhesive dressing.

## D.17.c. Third degree

For third degree, or deep, second degree burns:

- Cover the burn to reduce exposure to air.
- Cool the burn.
- Do not remove clothing unless smoldering.
- Treat for shock even if not apparent.
- Always obtain medical care.
- Monitor the patients airway.
- Assess vital signs every 5 minutes.
- Give nothing to eat or drink.
- Do not place ice on the burn.
- Do not apply ointments to the burn.
- Burns of the respiratory tract are always a medical emergency.

## D.18. Chemical burns

Chemical burns of the skin or eyes produce the same type of burn as flash fires, flames, steam, or hot liquids.

#### D.18.a. First aid

First aid for this type of burn is to wash the chemical away completely, as quickly as possible, using large quantities of water. Continue flushing the burn for at least 20 minutes.

When the burn involves an eye, flush the eye with water for five minutes. Then, cover both eyes with a clean, dry, protective dressing and seek medical attention as quickly as possible. Give first aid for shock.

If the chemical is a powder, brush off as much as possible before flushing with water.



### Section E. Environmental Injuries

### **Overview**

#### Introduction

Environmental injuries occur when an individual suffers from overexposure to extreme environmental elements or when taking poor precautions for activity in environmental elements. In severe cases, environmental injuries can cause permanent damage or loss of life. These types of injuries include emergencies caused by heat or cold such as heat stroke or hypothermia.

Additionally, these injuries are not only limited to environmental conditions but include other environmental factors such as injuries inflicted by non-human predators of the habitat. In the marine habitat, environmental injuries include those inflicted by aquatic life.

#### In this section

These items are discussed in this section:

Торіс	See Page
Emergencies Caused by Heat	5-48
Emergencies Caused by Cold	5-51
Hypothermia	5-53
Near-drowning	5-58
Fish Bites and Stings	5-59



### **Emergencies Caused by Heat**

#### E.1. Heat

Excessive heat or prolonged exposure to heat can cause at least three types of emergencies:

- Heat Cramps
- Heat Exhaustion
- Heat Stroke

#### E.2. Heat cramps

**Heat cramps** are painful contractions of various skeletal muscles. They are caused by depletion of salts from body fluids, normally due to excessive sweating.

#### E.2.a. Symptoms

Heat cramps affect the muscles of the extremities and of the abdominal wall. Pain may be severe. Body temperature may be normal or elevated.

#### E.2.b. Treatment

The treatment for heat cramps is drinking cool fluids that affords both relief and continued protection, "sport" drinks may speed up recovery. Do not re-expose to heat for at least 12 hours.

#### NOTE &

The use of hot packs on cramped muscles will only make the situation worse. DO NOT administer salt tablets for heat cramps!

## E.3. Heat exhaustion

**Heat exhaustion** results from too much fluid loss by perspiration. Even the most physically fit person can fall victim to heat exhaustion while working in a hot environment. With proper treatment heat exhaustion is seldom fatal.

#### E.3.a. Symptoms

The signs and symptoms of heat exhaustion are similar to those of shock. An individual that collapses in the heat and continues to perspire freely almost surely has heat exhaustion. The presence of sweating usually rules out heat stroke.



#### E.3.b. Treatment

To treat a person with heat exhaustion:

- Remove the patient from the hot environment to a cool location.
- Place a patient on his or her back, with legs elevated.
- Cool a patient but DO NOT chill.
- If the victim is conscious, administer cool sips of water or sports drink.
- Treat for shock.
- If equipped and trained, administer oxygen.

With general supportive treatment, a victim of heat exhaustion will usually recover consciousness promptly, although the person may not feel well for some time. Do not re-expose to heat for at least 24 hours.

#### E.4. Heat stroke

**Heat stroke** is a serious medical emergency. The most important sign of heat stroke is an extreme elevation of body temperature, indicating failure of the body's sweating mechanism. Heat stroke calls for immediate measures to reduce body temperatures in order to prevent brain damage and/or death.

#### E.4.a. Symptoms

The symptoms of heat stroke are:

- headache,
- dizziness,
- irritability, and
- disturbed vision.

A person will suddenly become unconscious, have hot, dry skin, and contracted pupils. A heat stroke victim will also have a full pulse, strong and bounding, may have convulsions, and a body temperature that ranges from 105° to 109°F.

#### E.4.b. Treatment

To treat a person with heat stroke:

- Seek help and activate the local EMS.
- Place the patient in the shade or a cool place. Assess breathing and circulation, loosen clothing, and lay the victim down with the head and shoulders slightly elevated.



### NOTE &

Carry out these procedures while seeking additional medical assistance.

- Begin the movement of air by fanning with a shirt, electric fan or other means.
- Reduce the body temperature as rapidly as possible to prevent brain damage. Total immersion in an ice water bath is probably the most efficient method. If this is not possible, decrease the patient's body temperature by pouring cool or cold water over the body, rubbing the body with ice and placing pieces of ice in the armpits, or covering the patient with sheets soaked in ice water.
- DO NOT give anything by mouth.
- Treat for shock.



## **Emergencies Caused by Cold**

### E.5. Cold injuries

The type and severity of cold injuries depends on the temperature and amount of exposure an individual has endured. Refer to the table below for a description of various cold injury causes and symptoms.

Injury	Cause	Symptoms
Chilblains	Repeated exposure for several hours at a time to temperatures between 32° and 60°F, generally	Signs and symptoms include: redness and swelling, itching dermatitis, tingling, and deep aches in later stages.
Immersion Foot	associated with high humidity.  Exposure to cold water 50°F and below for 12 hours or more, or exposure to water of approximately 70°F for several days.	Signs and symptoms include: swelling of the legs and feet, cyanosis (a bluish discoloration, especially of the skin due to a lack of properly oxygenated blood), numbness, tingling, itching, blisters, intense burning pain, and neuromuscular changes.
Trench Foot	Exposure to cold between 32° and 50°F, damp weather for periods ranging from several hours to 14 days. The average length of exposure to produce symptoms is three days. The body part affected blanches, tingles, then becomes numb.	Signs and symptoms include: swelling of the legs and feet, cyanosis, blisters, intense burning pain, and neuromuscular changes.
Frostbite	Generally, brief exposure to extreme cold -20°F and below, or exposure to approximately 0°F weather for several hours will cause frostbite.	Signs and symptoms include: first burning and stinging then numbness, ice crystals in the skin which cause white or gray waxy color, skin moves over bony prominences, edema (excessive accumulation of fluids within portions of the body), blisters, pain, loss of motion, and gangrene and loss of tissue in later stages



Injury	Cause	Symptoms
Freezing	Caused by exposure of skin to temperatures of -20°F and below. May happen rapidly to exposed toes and fingers with other extremities involved as exposure is prolonged.	Signs and symptoms include: ice crystals in entire thickness of the body part, including bone, which is indicated by pallid, yellow waxy color, skin will not move over bony prominences. After thawing, edema, large blisters, intense pain, loss of motion; and gangrene and loss of the body part in later stages.

### E.6. Treatment

### When treating cold injuries:

### NOTE &

Never treat cold injuries lightly! Tissue loss and nerve damage are caused by these type of injuries.

Dos	DON'Ts
<ul> <li>Take care when removing clothing or gear so as not to injure the numbed skin. Remove only if blankets or dry clothing are available.</li> <li>Cover the area with a dry dressing and warm with a blanket.</li> <li>Exercise care to prevent infection if open sores are present.</li> <li>Under the supervision of a medical professional, rapidly warm a frostbitten body part in a controlled temperature water bath (105° to 110°F). Attempt this only where there is a certainty of the water temperature.</li> <li>Transport the patient to an appropriate medical facility as soon as possible.</li> <li>Monitor for shock.</li> </ul>	<ul> <li>DO NOT place anything constricting on the affected area.</li> <li>DO NOT give the victim alcohol or tobacco.</li> <li>DO NOT massage or rub the affected parts.</li> <li>DO NOT break blisters.</li> <li>DO NOT thaw an affected part if the transport time is short or if there is a possibility that the body part may refreeze after warming.</li> <li>Do NOT give alcohol.</li> </ul>



### **Hypothermia**

#### E.7. General

Hypothermia is a lowering of a person's core temperature. It occurs when a person suffers a loss of body heat. General body hypothermia is the leading cause of death among survivors of shipwrecks, and other disasters at sea. If not recognized and treated promptly, hypothermia can rapidly turn survivors into fatalities. Survivors in critical hypothermia conditions may suffer a fatal loss of body temperature from physical exertion, or as a result of any delay in taking immediate and positive measures to restore body heat. Struggling survivors, trying to aid in their own rescue, may drive their body temperature down to the point where unconsciousness and/or death results. Survivors removed from the water and left untreated may suffer further critical loss in body temperature, bringing on death after being rescued. Note that survivors in "warm" water can also suffer from hypothermia if exposed for long enough periods of time. Also, cold air temperatures can bring on hypothermia if adequate protective clothing is not worn.

#### E.8. Survivability

Survival times in water vary considerably. Survival depends on the type of clothing worn, the amount of physical exertion, the blood alcohol levels, and other factors. Some survivors, when taken aboard during a search and rescue case, may appear to be under the influence of drugs or alcohol. A person moderately hypothermic will manifest symptoms of an intoxicated person.

## E.9. Symptoms and signs

When a victim may be suffering from hypothermia, there are symptoms that are visible and some that must be measured to establish a diagnosis. These include:

- low body temperature
- low blood pressure
- slow, weak pulse
- unconsciousness
- general appearance
- cold skin
- may simulate or accompany shock



#### Signs may include:

- skin is cold
- shivering
- clouded mental capacity (may seem disoriented)
- breathing slow and labored
- pulse weak and slow, may be irregular or absent
- pupils dilated
- speech slurred (may seem intoxicated)

## E.9.a Body temperature

**Body temperature** is the most useful yardstick for identifying hypothermia. Hypothermia victims will have a rectal temperature below normal (normal is 98°F-99°F). Only rectal temperatures are of value, since it is the body's core temperature that determines the severity of hypothermia. Neither oral or auxiliary temperatures, nor the temperatures of the extremities, reflect core temperature. DO NOT attempt to take rectal temperatures in the field. Treat the patient as visible signs and symptoms suggest.

Temperature	Visible Signs and Symptoms
99°-96° F	Intense uncontrollable shivering; impaired ability to
	perform complex tasks.
95°-91° F	Violent shivering; difficulty speaking; sluggish
	movements; amnesia begins.
90°-86° F	Shivering is replaced by muscular rigidity; muscle
	coordination impaired; erratic movements.
85°-81° F	Irrational; stupor; lost contact with surroundings; pulse
	and respiration slow.
80°-78° F	No response to words; reflexes stop working; heartbeat
	is erratic; victim loses consciousness.
Below 78° F	Failure of heart and lungs; internal bleeding; death.

### NOTE &

The leading cause of death in cold water maritime accidents is hypothermia.

E.9.b. Blood pressure

Hypothermia victims may have a lower than normal **blood pressure** (normal is about 120/80).



## E.9.c. Visible symptoms

These are outwardly visible symptoms that can help to identify hypothermia victims:

- Slow, weak, and often irregular, **pulse**.
- Level of consciousness becomes clouded as their body temperature approaches 90oF and they generally lose consciousness at 85oF.
- Pale in appearance, with constricted pupils, and slow and labored respiration. Violent shivering or muscular rigidity may be present. Victims may appear to be intoxicated.

Begin treatment if a victim's **skin feels cold** to the touch.

## E.10. Rescue precautions

When it is suspected a survivor has critical hypothermia, make rescue attempts that avoid rough handling and minimize the amount of exertion by a victim. This can be accomplished by sending a surface swimmer into the water to assist the survivor into the rescue craft. Take care to handle a victim gently. Excessive movement may cause heart beat irregularities which can be fatal. During the rescue and afterwards, keep a patient calm and quiet. DO NOT allow a person to perform any physical activity other than what is absolutely necessary. Exertion can use up large amounts of body heat which would otherwise be available to raise the survivor's internal body temperature.

## E.11. Basic treatment

Treatment for hypothermia will depend on both the condition of a survivor and the facilities available for treating the victim. Survivors who are rational and capable of recounting their experiences, although shivering dramatically, will generally require only that all wet clothes be removed and dry clothes or blankets and a warm environment be provided for resting.



## E.12. Advanced treatment

In more serious cases, where victims are semiconscious or near death, contact a medical facility as soon as possible for detailed instructions for proper care and handling. While awaiting medical instructions, immediately administer first-aid to survivors using these steps:

Step	Procedure
1	After recovering a victim from the cold, avoid rough handling of
	the victim as this can cause further harm. Check for the presence
	of breathing and heartbeat. If the victim is not breathing and has
	no heart beat, begin CPR immediately. If the victim is breathing,
	and has a pulse, gently transfer the person to a warm
	environment. Be sure to check the person's breathing and heart
	beat frequently. always remain prepared to immediately begin
	CPR if breathing and heart beat stop. Activate EMS. Do not
	minimize, always obtain medical help.
2	Lay an unconsciousness or semiconscious victim face up with the
	head slightly lower than the rest of the body. If vomiting occurs,
	turn the patient's head to one side. Observe respiration closely
	and remove any secretions from a victim's nose and mouth.
3	Remove a victim's clothes with minimum movement of the body.
	Cut the clothes away with scissors or a knife if necessary. If a
	patient cannot be removed to a compartment to be warmed with
	blankets, dry clothing, or other warming methods, then DO NOT
	remove wet clothing. Under these circumstances, the wet
	clothing is better than no clothing.



### **CAUTION!**

Step

Semiconscious or unconscious persons should not be given anything to eat or drink.

4	Give nothing orally. Giving alcohol as a treatment for
	hypothermia victims is not recommended because it further
	restricts circulation.
5	Insulate a victim from further heat loss by wrapping the person in
	a blanket. DO NOT attempt to aggressively rewarm an
	unconscious or semiconscious victim, as rapid warming can cause
	dangerous complications. DO NOT rub frozen body areas. A
	victim will be very sensitive to rough handling. The primary
	objective after a person has been removed from the water is to
	prevent the person from getting colder.
6	If properly trained and equipped, administer warm, humidified
	oxygen by face mask. The oxygen will not only assist victims if
	they are having difficulty breathing or have a low respiratory rate,
	it will also provide rewarming of the internal body core.
7	When there will be a delay getting a victim to a hospital, begin
	gentle rewarming techniques. Rewarming techniques include:

**Procedure** 

### **WARNING** 💖

Hypothermia patients are very prone to burns. Hot packs, heating pads, and hot water bottles may cause third degree burns and must be administered with extreme care.

	genite to warming teeninques free warming teeninques metade.		
	• Wrapping the victim in a blanket. Under the blanket, apply heating pads or hot water bottles (if available) to the victim's head, neck and groin.		
	Applying your body warmth by direct body-to-body contact		
	with a victim. A blanket should be wrapped around you and		
	the victim to preserve the heat.		
8	Treat for shock. Be alert to the ABC's of shock treatment.		
9	Evacuate a victim to a medical facility soon after or during		
	emergency treatment. A medical phone patch can be set up		
	through the Coast Guard station if needed. A helicopter with an		
	EMT can be sent to provide help and to evacuate a victim.		



### **Near-drowning**

#### E.13. General

Victims who inhale water or who are found floating face-down in the water may be suffering from **near-drowning**. Medical researchers have only recently discovered the phenomena of the "mammalian diving reflex." In this condition, a person immersed in water (particularly a child), even under ice, could still be alive. Even after extended periods of time, the body delivers a tiny trickle of oxygen to the brain. A victim also exhibits an almost complete constriction of all peripheral blood vessels. Their respiration and circulation almost stop. Properly administered CPR may successfully revive a near-drowning victim without serious complications, even after being underwater for an hour or longer.

#### E.14. Treatment

To treat a person in a near-drowning situation:

- Evaluate A,B, Cs
- Identify any other injuries
- Activate EMS
- Initiate CPR if indicated and trained
- Treat for shock
- Inform station of status of victim
- Transport as soon as possible
- Remove we clothing
- Treat for hypothermia as appropriate
- Constantly monitor the victim's airway
- Reevaluate victims vital signs every 5 minutes
- Document
  - length of submersion
  - water temperature
  - fresh or salt water
  - drug or alcohol use
  - any treatment rendered



### **Fish Bites and Stings**

#### E.15. General

Fish bites and stings are another common problem encountered by boat crews during rescues. They can range from innocuous to deadly and boat crew members must be constantly alert to identify bites and stings as quickly as possible.

## E.16. Types of bites and stings

Victims may suffer many different types of bites and stings. The types encountered will depend in a large part on the area of operations and the sea life that exists there. It is important that to become familiar with the most common types of bites and stings that are encountered and the proper treatments for them.

## E.17. Effects and treatment

The table below describes the effects and proper treatment for various fish bites/stings encountered.

Bite/Sting	Effects	Treatment
Shark & Barracuda	Shark and barracuda bites	Control bleeding with pressure
Bites	generally result in loss of large	dressings, if possible. If not, use
	amounts of tissue. Prompt and	pressure points or tourniquets. Seek
	vigorous action to control	medical help immediately.
	hemorrhage and shock are	
	required to save a victim's life.	
Fish Stings	Fish sting symptoms include:	Individuals extremely sensitive to fish
	• burning,	stings may rapidly go into shock and
	• stinging,	require immediate evacuation to save
	• redness,	their life.
	• swelling,	
	• rash,	
	• blisters,	
	<ul> <li>abdominal cramps,</li> </ul>	
	• numbness,	
	• dizziness,	
	• and shock.	



Bite/Sting	Effects	Treatment
Portuguese Man-of-	Jellyfish sting symptoms	For Portuguese Man-of-War and
War & Jellyfish	include burning, stinging,	jellyfish stings, remove all tentacles
	redness, and jelly-like matter	immediately and wash the surface of the
	from tentacles stuck on the	skin with alcohol. Apply calamine
	body	lotion, meat tenderizer, or ammonia
		water to neutralize the effects of the
		toxin contained in the tentacles.
Stingray Injuries	Stingray injuries typically have a small open wound with swelling.	<ul> <li>Immediately irrigate the wound from a stingray with cold salt water. Most of the toxins will wash out and the cold water will reduce the pain.</li> <li>Immerse the wounded area in hot water for 30 to 60 minutes. Keep the water as hot as a patient can tolerate without injury.</li> <li>Apply hot compresses to wounds in areas not lending themselves to complete immersion.</li> <li>Apply a sterile dressing after the soak.</li> </ul>



### **Section F. Miscellaneous Emergencies**

### **Overview**

#### Introduction

Boat crew member will face a variety of emergencies that will require performing first aid. This section discusses miscellaneous emergencies that boat crew members will encounter aboard their own vessel or when dealing with marine casualties.

#### In this section

These items are discussed in this section:

Topic	See Page
Carbon Monoxide Poisoning	5-62
Poisoning by Mouth	5-63
Eye Injuries	5-64



### **Carbon Monoxide Poisoning**

#### F.1. General

Carbon Monoxide (CO) is a colorless, odorless toxic gas that is the product of incomplete combustion. Motor vehicles, heater and appliances that use carbon based fuels are the main sources of this poison.

## F.2. Signs and symptoms

Can include headache, dizziness, fatigue, weakness, drowsiness, nausea, vomiting, loss of consciousness, skin pallor, shortness of breath on exertion, palpitation, confusion, irritability and irrational behavior.

#### F.3. Treatment

Removal from the CO containing atmosphere. Treat for shock. Administer Oxygen as available and trained to do so. Start CPR as appropriate.



### **Poisoning by Mouth**

#### F.4. General

When poisoning occurs, it is vital that proper first aid be given immediately.

## F.5. Seeking advice

The product container will often include specific treatment instructions. If not, seek medical assistance immediately. The boat crew should contact its unit, provide information about substance taken and an estimate of the quantity taken and have the unit immediately contact the local poison control center . Take the container and any samples of vomit with a victim when transporting to a medical facility.

# F.6. Medical assistance not available

If medical advice is not immediately available and the patient is conscious, determine if the poison is a strong acid, alkali, or petroleum product. If this is the case, do not attempt to induce vomiting by applying pressure to the back of a victim's tongue. Do Not induce vomiting if patient is not fully conscious.

#### F.7. Treatment

Closely observe the ABC's for shock treatment during transport.

#### **CAUTION!**

Determine if the victim shows signs of a sensitivity reaction to the substance. This will indicate a victim in anaphylactic shock. In this case, treat the victim accordingly (Refer to Section B, "Treatment for Shock".)



### **Eye Injuries**

#### F.8. General

Eye injuries are potentially serious, and may be permanent, unless handled promptly and properly. Eyes should be moist. Any dressing applied to eyes should also be moist to prevent excessive drying.

Eye movement is conjugal, that is if one eye moves, the other also moves in the same manner. When dealing with a penetrating injury to an eye, or a foreign object in an eye, the objective is to limit eye movement. Because of conjugal movement, this is best accomplished by covering both eyes. In most cases, a patient with an eye injury is transported sitting up.

#### F.9. Blindness

Patients who have experienced a blinding injury become totally dependent upon their rescuer. Never leave these patients alone. Keep in constant contact and talk with them continuously to reduce anxiety.

## F.10. Types of eye injuries

There are many injuries that may occur to a victim's eyes. Any eye injury is normally the cause of great anxiety for a victim, many times causing more concern than more serious injuries to other parts of the body. As a boat crew member, keep this thought in mind while rescuing or treating victims.

## F.11. Symptoms and treatments

The following table describes the symptoms and appropriate treatments for the various eye injuries.

Eye Injury	Symptom	Treatment
Blunt Eye Trauma	Blows to a victim's head and	Managing such injuries requires covering
	eye area may result in a	both eyes with a moist dressing. This is
	fracture to the orbit (the	important since movement by an
	bony socket encircling the	uninjured eye is mimicked by the injured
	eye), entrapping vessels and	eye. Refer the patient to medical care for
	nerves to the eye.	follow up. Since this injury may involve a
		head injury, closely observe the patient
		for signs of further damage.



Eye Injury	Symptom	Treatment
Penetrating Objects	Common objects include	Any object that has penetrated the eye
and Foreign Bodies	fish hooks, wood splinters,	must NOT be removed as first aid
	or pieces of glass.	treatment. Cover both eyes with a moist
		dressing, and support the object if it
		protrudes to prevent movement. A
		protective cup for the eye can be made
		from a plastic or styrofoam cup taped
		over the eye, with a moist dressing inside.
		Immediately refer this patient for further
		medical care.
Caustics, Acids or	Symptoms may include	Immediately flush both eyes with large
Burns	remains of the substance	quantities of gently flowing water. Each
	itself, pain, swelling,	eye should be flushed with water for a
	discoloration of the skin,	minimum of 10-15 minutes away from
	peeling of skin, and blisters.	the unaffected eye. Never use a
		neutralizing agent for flushing, use only
		plain tap water. A moist dressing may be
		helpful. After flushing, refer the patient
		for further care.

